



IFWO

## RAW SEQUENCE LISTING

DATE: 08/27/2004

PATENT APPLICATION: US/10/723,475

TIME: 11:58:14

Input Set : N:\Crf3\RULE60\10723475.raw

Output Set: N:\CRF4\08272004\J723475.raw

1 <110> APPLICANT: CALIFORNIA INSTITUTE OF TECHNOLOGY  
 2 LYAPINA, Svetlana  
 3 VERMA, Rati  
 4 DESHAIES, Raymond  
 5 <120> TITLE OF INVENTION: REGULATION OF TARGET PROTEIN ACTIVITY THROUGH MODIFIER

## PROTEINS

6 <130> FILE REFERENCE: CIT1510-3  
 7 <140> CURRENT APPLICATION NUMBER: US/10/723,475  
 8 <141> CURRENT FILING DATE: 2003-11-25  
 9 <150> PRIOR APPLICATION NUMBER: US/10/046,961  
 10 <151> PRIOR FILING DATE: 2002-01-14  
 11 <150> PRIOR APPLICATION NUMBER: US 60/261,314  
 12 <151> PRIOR FILING DATE: 2001-01-12  
 13 <150> PRIOR APPLICATION NUMBER: US 60/322,322  
 14 <151> PRIOR FILING DATE: 2001-09-14  
 15 <150> PRIOR APPLICATION NUMBER: US 60/322,030  
 16 <151> PRIOR FILING DATE: 2001-09-14  
 17 <160> NUMBER OF SEQ ID NOS: 22  
 18 <170> SOFTWARE: PatentIn version 3.1

ENTERED

20 &lt;210&gt; SEQ ID NO: 1

21 &lt;211&gt; LENGTH: 14

22 &lt;212&gt; TYPE: PRT

23 &lt;213&gt; ORGANISM: Artificial sequence

24 &lt;220&gt; FEATURE:

25 &lt;223&gt; OTHER INFORMATION: JAM domain

W--&gt; 26 &lt;221&gt; NAME/KEY: MISC\_FEATURE

27 &lt;222&gt; LOCATION: (1)..(14)

28 &lt;223&gt; OTHER INFORMATION: Xaa is any amino acid

W--&gt; 29 &lt;400&gt; 1

W--&gt; 30 His Xaa His Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Asp

31 1 5 10

33 &lt;210&gt; SEQ ID NO: 2

34 &lt;211&gt; LENGTH: 17

35 &lt;212&gt; TYPE: PRT

36 &lt;213&gt; ORGANISM: Artificial sequence

37 &lt;220&gt; FEATURE:

38 &lt;223&gt; OTHER INFORMATION: JAM domain

W--&gt; 39 &lt;221&gt; NAME/KEY: MISC\_FEATURE

40 &lt;222&gt; LOCATION: (3)..(3)

41 &lt;223&gt; OTHER INFORMATION: Xaa is Tyr or Ile

W--&gt; 42 &lt;221&gt; MISC\_FEATURE

43 &lt;222&gt; LOCATION: (5)..(5)

44 &lt;223&gt; OTHER INFORMATION: Xaa is Ser or Thr

W--&gt; 45 &lt;221&gt; MISC\_FEATURE

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Input Set : N:\Crff3\RULE60\10723475.raw

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46 &lt;222&gt; LOCATION: (8)..(16)

47 &lt;223&gt; OTHER INFORMATION: Xaa is any amino acid

W--&gt; 48 &lt;400&gt; 2

W--&gt; 49 Gly Trp Xaa His Xaa His Pro Xaa Xaa Xaa Xaa Xaa Xaa Ser Xaa Xaa

50 1 5 10 15

51 Asp

53 &lt;210&gt; SEQ ID NO: 3

54 &lt;211&gt; LENGTH: 246

55 &lt;212&gt; TYPE: PRT

56 &lt;213&gt; ORGANISM: Homo sapiens

57 &lt;400&gt; SEQUENCE: 3

58 Thr Met Ile Ile Met Asp Ser Phe Ala Leu Pro Val Glu Gly Thr Glu

59 1 5 10 15

60 Thr Arg Val Asn Ala Gln Ala Ala Tyr Glu Tyr Met Ala Ala Tyr

61 20 25 30

62 Ile Glu Asn Ala Lys Gln Val Gly Arg Leu Glu Asn Ala Ile Gly Trp

63 35 40 45

64 Tyr His Ser His Pro Gly Tyr Gly Cys Trp Leu Ser Gly Ile Asp Val

65 50 55 60

66 Ser Thr Gln Met Leu Asn Gln Gln Phe Gln Glu Pro Phe Val Ala Val

67 65 70 75 80

68 Val Ile Asp Pro Thr Arg Thr Ile Ser Ala Gly Lys Val Asn Leu Gly

69 85 90 95

70 Ala Phe Arg Thr Tyr Pro Lys Gly Tyr Lys Pro Pro Asp Glu Gly Pro

71 100 105 110

72 Ser Glu Tyr Gln Thr Ile Pro Leu Asn Lys Ile Glu Asp Phe Gly Val

73 115 120 125

74 His Cys Lys Gln Tyr Tyr Ala Leu Glu Val Ser Tyr Phe Lys Ser Ser

75 130 135 140

76 Leu Asp Arg Lys Leu Leu Glu Leu Leu Trp Asn Lys Tyr Trp Val Asn

77 145 150 155 160

78 Thr Leu Ser Ser Ser Ser Leu Leu Thr Asn Ala Asp Tyr Thr Thr Gly

79 165 170 175

80 Gln Val Phe Asp Leu Ser Glu Lys Leu Glu Gln Ser Glu Ala Gln Leu

81 180 185 190

82 Gly Arg Gly Ser Phe Met Leu Gly Leu Glu Thr His Asp Arg Lys Ser

83 195 200 205

84 Glu Asp Lys Leu Ala Lys Ala Thr Arg Asp Ser Cys Lys Thr Thr Ile

85 210 215 220

86 Glu Ala Ile His Gly Leu Met Ser Gln Val Ile Lys Asp Lys Leu Phe

87 225 230 235 240

88 Asn Gln Ile Asn Ile Ser

89 245

91 &lt;210&gt; SEQ ID NO: 4

92 &lt;211&gt; LENGTH: 245

93 &lt;212&gt; TYPE: PRT

94 &lt;213&gt; ORGANISM: Homo sapiens

95 &lt;400&gt; SEQUENCE: 4

96 Thr Val Arg Val Ile Asp Val Phe Ala Met Pro Gln Ser Gly Thr Gly

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Input Set : N:\Crf3\RULE60\10723475.raw

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97      1          5          10          15
98  Val Ser Val Glu Ala Val Asp Pro Val Phe Gln Ala Lys Met Leu Asp
99      20          25          30
100    Met Leu Lys Gln Thr Gly Arg Pro Glu Met Val Val Gly Trp Tyr His
101      35          40          45
102    Ser His Pro Gly Phe Gly Cys Trp Leu Ser Gly Val Asp Ile Asn Thr
103      50          55          60
104    Gln Gln Ser Phe Glu Ala Leu Ser Glu Arg Ala Val Ala Val Val Val
105      65          70          75          80
106    Asp Pro Ile Gln Ser Val Lys Gly Lys Val Val Ile Asp Ala Phe Arg
107      85          90          95
108    Leu Ile Asn Ala Asn Met Met Val Leu Gly His Glu Pro Arg Gln Thr
109      100         105         110
110    Thr Ser Asn Leu Gly His Leu Asn Lys Pro Ser Ile Gln Ala Leu Ile
111      115         120         125
112    His Gly Leu Asn Arg His Tyr Tyr Ser Ile Thr Ile Asn Tyr Arg Lys
113      130         135         140
114    Asn Glu Leu Glu Gln Lys Met Leu Leu Asn Leu His Lys Lys Ser Trp
115      145         150         155         160
116    Met Glu Gly Leu Thr Leu Gln Asp Tyr Ser Glu His Cys Lys His Asn
117      165         170         175
118    Glu Ser Val Val Lys Glu Met Leu Glu Leu Ala Lys Asn Tyr Asn Lys
119      180         185         190
120    Ala Val Glu Glu Glu Asp Lys Met Thr Pro Glu Gln Leu Ala Ile Lys
121      195         200         205
122    Asn Val Gly Lys Gln Asp Pro Lys Arg His Leu Glu Glu His Val Asp
123      210         215         220
124    Val Leu Met Thr Ser Asn Ile Val Gln Cys Leu Ala Ala Met Leu Asp
125      225         230         235         240
126    Thr Val Val Phe Lys
127      245
129 <210> SEQ ID NO: 5
130 <211> LENGTH: 421
131 <212> TYPE: PRT
132 <213> ORGANISM: Homo sapiens
133 <400> SEQUENCE: 5
134    Met Pro Asp His Thr Asp Val Ser Leu Ser Pro Glu Glu Arg Val Arg
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136    Ala Leu Ser Lys Leu Gly Cys Asn Ile Thr Ile Ser Glu Asp Ile Thr
137      20          25          30
138    Pro Arg Arg Tyr Phe Arg Ser Gly Val Glu Met Glu Arg Met Ala Ser
139      35          40          45
140    Val Tyr Leu Glu Glu Gly Asn Leu Glu Asn Ala Phe Val Leu Tyr Asn
141      50          55          60
142    Lys Phe Ile Thr Leu Phe Val Glu Lys Leu Pro Asn His Arg Asp Tyr
143      65          70          75          80
144    Gln Gln Cys Ala Val Pro Glu Lys Gln Asp Ile Met Lys Lys Leu Lys
145      85          90          95
146    Glu Ile Ala Phe Pro Arg Thr Asp Glu Leu Lys Asn Asp Leu Leu Lys

```

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TIME: 11:58:15

Input Set : N:\Crf3\RULE60\10723475.raw

Output Set: N:\CRF4\08272004\J723475.raw

```

147          100          105          110
148  Lys Tyr Asn Val Glu Tyr Gln Glu Tyr Leu Gln Ser Lys Asn Lys Tyr
149          115          120          125
150  Lys Ala Glu Ile Leu Lys Lys Leu Glu His Gln Arg Leu Ile Glu Ala
151          130          135          140
152  Glu Arg Lys Arg Ile Ala Gln Met Arg Gln Gln Gln Leu Glu Ser Glu
153  145          150          155          160
154  Gln Phe Leu Phe Phe Glu Asp Gln Leu Lys Lys Gln Glu Leu Ala Arg
155          165          170          175
156  Gly Gln Met Arg Ser Gln Gln Thr Ser Gly Leu Ser Glu Gln Ile Asp
157          180          185          190
158  Gly Ser Ala Leu Ser Cys Phe Ser Thr His Gln Asn Asn Ser Leu Leu
159          195          200          205
160  Asn Val Phe Ala Asp Gln Pro Asn Lys Ser Asp Ala Thr Asn Tyr Ala
161          210          215          220
162  Ser His Ser Pro Pro Val Asn Arg Ala Leu Thr Pro Ala Ala Thr Leu
163  225          230          235          240
164  Ser Ala Val Gln Asn Leu Val Val Glu Gly Leu Arg Cys Val Val Leu
165          245          250          255
166  Pro Glu Asp Leu Cys His Lys Phe Leu Gln Leu Ala Glu Ser Asn Thr
167          260          265          270
168  Val Arg Gly Ile Glu Thr Cys Gly Ile Leu Cys Gly Lys Leu Thr His
169          275          280          285
170  Asn Glu Phe Thr Ile Thr His Val Ile Val Pro Lys Gln Ser Ala Gly
171          290          295          300
172  Pro Asp Tyr Cys Asp Met Glu Asn Val Glu Glu Leu Phe Asn Val Gln
173  305          310          315          320
174  Asp Gln His Asp Leu Leu Thr Leu Gly Trp Ile His Thr His Pro Thr
175          325          330          335
176  Gln Thr Ala Phe Leu Ser Ser Val Asp Leu His Thr His Cys Ser Tyr
177          340          345          350
178  Gln Leu Met Leu Pro Glu Ala Ile Ala Ile Val Cys Ser Pro Lys His
179          355          360          365
180  Lys Asp Thr Gly Ile Phe Arg Leu Thr Asn Ala Gly Met Leu Glu Val
181          370          375          380
182  Ser Ala Cys Lys Lys Lys Gly Phe His Pro His Thr Lys Glu Pro Arg
183  385          390          395          400
184  Leu Phe Ser Ile Cys Lys His Val Leu Val Lys Asp Ile Lys Ile Ile
185          405          410          415
186  Val Leu Asp Leu Arg
187          420
189 <210> SEQ ID NO: 6
190 <211> LENGTH: 461
191 <212> TYPE: PRT
192 <213> ORGANISM: Homo sapiens
193 <400> SEQUENCE: 6
194  Met Asp Gln Pro Phe Thr Val Asn Ser Leu Lys Lys Leu Ala Ala Met
195  1          5          10          15
196  Pro Asp His Thr Asp Val Ser Leu Ser Pro Glu Glu Arg Val Arg Ala

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TIME: 11:58:15

Input Set : N:\Crf3\RULE60\10723475.raw

Output Set: N:\CRF4\08272004\J723475.raw

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197          20          25          30
198  Leu Ser Lys Leu Gly Cys Asn Ile Thr Ile Ser Glu Asp Ile Thr Pro
199          35          40          45
200  Arg Arg Tyr Phe Arg Ser Gly Val Glu Met Glu Arg Met Ala Ser Val
201          50          55          60
202  Tyr Leu Glu Glu Gly Asn Leu Glu Asn Ala Phe Val Leu Tyr Asn Lys
203  65          70          75          80
204  Phe Ile Thr Leu Phe Val Glu Lys Leu Pro Asn His Arg Asp Tyr Gln
205          85          90          95
206  Gln Cys Ala Val Pro Glu Lys Gln Asp Ile Met Lys Lys Leu Lys Glu
207          100          105          110
208  Ile Ala Phe Pro Arg Thr Asp Glu Leu Lys Asn Asp Leu Leu Lys Lys
209          115          120          125
210  Tyr Asn Val Glu Tyr Gln Glu Tyr Leu Gln Ser Lys Asn Lys Tyr Lys
211          130          135          140
212  Ala Glu Ile Leu Lys Lys Leu Glu His Gln Arg Leu Ile Glu Ala Glu
213  145          150          155          160
214  Arg Lys Arg Ile Ala Gln Met Arg Gln Gln Gln Leu Glu Ser Glu Gln
215          165          170          175
216  Phe Leu Phe Phe Glu Asp Gln Leu Lys Lys Gln Glu Leu Ala Arg Gly
217          180          185          190
218  Gln Met Arg Ser Gln Gln Thr Ser Gly Leu Ser Glu Gln Ile Asp Gly
219          195          200          205
220  Ser Ala Leu Ser Cys Phe Ser Thr His Gln Asn Asn Ser Leu Leu Asn
221          210          215          220
222  Val Phe Ala Asp Gln Pro Asn Lys Ser Asp Ala Thr Asn Tyr Ala Ser
223  225          230          235          240
224  His Ser Pro Pro Val Asn Arg Ala Leu Thr Pro Ala Ala Thr Leu Ser
225          245          250          255
226  Ala Val Gln Asn Leu Val Val Glu Gly Leu Arg Cys Val Val Leu Pro
227          260          265          270
228  Glu Asp Leu Cys His Lys Phe Leu Gln Leu Ala Glu Ser Asn Thr Val
229          275          280          285
230  Arg Gly Ile Glu Thr Cys Gly Ile Leu Cys Gly Lys Leu Thr His Asn
231          290          295          300
232  Glu Phe Thr Ile Thr His Val Ile Val Pro Lys Gln Ser Ala Gly Pro
233  305          310          315          320
234  Asp Tyr Cys Asp Met Glu Asn Val Glu Glu Leu Phe Asn Val Gln Asp
235          325          330          335
236  Gln His Asp Leu Leu Thr Leu Gly Trp Ile His Thr His Pro Thr Gln
237          340          345          350
238  Thr Ala Phe Leu Ser Ser Val Asp Leu His Thr His Cys Ser Tyr Gln
239          355          360          365
240  Leu Met Leu Pro Glu Ala Ile Ala Ile Val Cys Ser Pro Lys His Lys
241          370          375          380
242  Asp Thr Gly Ile Phe Arg Leu Thr Asn Ala Gly Met Leu Glu Val Ser
243  385          390          395          400
244  Ala Cys Lys Lys Lys Gly Phe His Pro His Thr Lys Glu Pro Arg Leu
245          405          410          415

```

RAW SEQUENCE LISTING ERROR SUMMARY

DATE: 08/27/2004

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TIME: 11:58:16

Input Set : N:\Crf3\RULE60\10723475.raw

Output Set: N:\CRF4\08272004\J723475.raw

Please Note:

Use of n and/or Xaa have been detected in the Sequence Listing. Please review the Sequence Listing to ensure that a corresponding explanation is presented in the <220> to <223> fields of each sequence which presents at least one n or Xaa.

Seq#:1; Xaa Pos. 2,4,5,6,7,8,9,10,11,12,13

Seq#:2; Xaa Pos. 3,5,8,9,10,11,12,13,15,16

Invalid Line Length:

The rules require that a line not exceed 72 characters in length. This includes spaces.

Seq#:1; Line(s) 5

**VERIFICATION SUMMARY**

DATE: 08/27/2004

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Input Set : N:\Crf3\RULE60\10723475.raw

Output Set: N:\CRF4\08272004\J723475.raw

L:26 M:281 W: Numeric Fields not Ordered, <221> Sort in ascending order!  
L:29 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:1  
L:30 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:1 after pos.:0  
L:39 M:281 W: Numeric Fields not Ordered, <221> Sort in ascending order!  
L:42 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:2  
L:45 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:2  
L:48 M:258 W: Mandatory Feature missing, <220> Tag not found for SEQ ID#:2  
L:49 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:2 after pos.:0